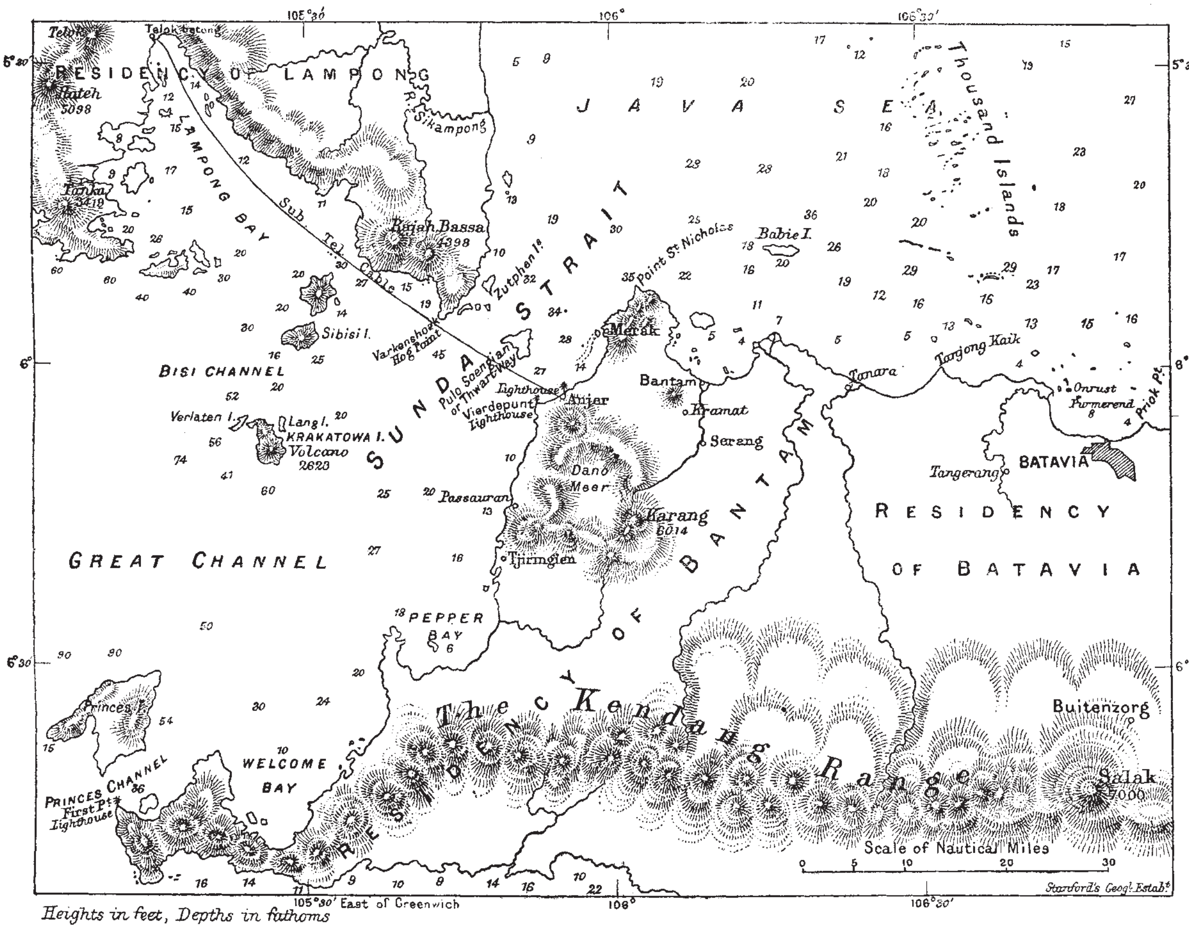
dition of the ocean bed. The existing charts of the strait with their careful soundings are useless for purposes of navigation, and when quiescence is restored a new series of soundings will be necessary. Doubtless the results of the outbreak will receive minute attention at the hands of the Dutch Government, and when all the data are collected they will form valuable material for the study of the physical geographer.



Heights in feet, Depths in fathoms

NOTES

THE next meeting of the American Association for the Advancement of Science will be held in Philadelpnia, probably during the first week in September, 1884. At the session in Minneapolis the following persons were chosen as officers for the Philadelphia meeting:—President, Dr. J. P. Leslie, of Philadelphia; Vice-Presidents: Section A (Mathematics and Astronomy), Prof. H. T. Eddy, of Cincinnati; B (Physics), Prof. John Trowbridge, of Cambridge; C (Chemistry), Prof. J. W. Langley, of Ann Arbour; D (Mechanical Science), Prof. R. H. Thurston, of Hoboken; E (Geology and Geography), Prof. N. H. Winchell, of Minneapolis; F (Biology), Prof. E. D. Cope, of Philadelphia; G (Histology and Microscopy), Prof. T. G. Wormley, of Philadelphia; H (Anthropology), Prof. E. S. Morse, of Salem; I (Economic Science and Statistics), Hon. John Eaton, of Washington; permanent secretary, Mr. F. W. Putnam, of Cambridge; general secretary, Dr. Alfred Springer, of Cincinnati; assistant general secretary, Prof. E. S. Holden, of Madison.

M. JANSSEN, who has returned from Caroline Island, was present at the meeting of the Academy of Sciences of September 3. He read the first part of the documents he brings with him, viz. the reports drawn up by Palisa, Tacchini, and himself, while Trouvelot read his own account. The reading was long and interesting, and will be continued next week. M. Janssen stated that he believed the region around the sun was full of material almost corpuscular, and reflecting the light from the sun. He was received enthusiastically, and M. Blanchard, the president, spoke in praise of his merits and efforts for the promotion of science. M. Janssen returned thanks, acknowledging that great efforts must be made by him to be worthy of such a reception.

WE regret to announce the death of Mr. Cromwell Fleetwood Varley, F.R.S., M.I.C.E., &c., on Sunday night last, at his residence at Bexley Heath, Kent. He was born in Kentish Town, April 6, 1828. He devoted himself to the engineering branch of telegraphy, and devised a method of locating distant faults in land wires which attracted the special attention of engineers and electricians. Distinguishing himself by one discovery after another, Mr. Varley finally became chief engineer and electrician to the Electric and International Telegraph Company, and held this office until the taking over of the telegraphs by the Government. His inventions were very numerous. Prominent among his early inventions was an apparatus for transmitting electrical signals, which so much increased the sensitiveness and trustworthiness of the relay that it became practicable for the first time to work from London to Edinburgh direct—a feat impossible in the conditions of insulation previously existing. Mr. Varley was associated with Robert Stephenson, Sir William Fairbairn, and others in devising the first Atlantic cable which may be said to have achieved success. By means of a working model apparatus he demonstrated approximately the speed of electricity when on its travels.

Mr. V. T. Chambers, an entomologist well known for his studies on Tineina, died at his residence in Covington, Ky., U.S., on August 7.

During the past year, we learn from *Science*, original investigations in the following subjects, among others, have been carried on in the physical laboratory of Johns Hopkins University under the direction of Prof. Rowland and Dr. Hastings: on the photography of the spectrum by means of the concave grating; on the determination of the B. A. unit of electrical resistance in absolute measure; the determination of the specific resistance of mercury; the variation of the specific heat of water with the temperature; the relative wave-lengths of the lines of the spectrum by means of the concave grating; the effect of difference of phase in the harmonics on the timbre of sound; and on the variation of the magnetic permeability of nickel by change of temperature.

Mr. Thomas Plant, the well-known meteorologist of Birmingham, died suddenly last week. Mr. Plant was sixty-four years ot age, and was a native of Lowmoor, Yorkshire. From early manhood he had a passion for the study of the wind and the weather. This passion took a very systematic shape in the compilation of regular records of rainfall, windage, and temperature; and, to the student of meteorology, these records, the result of Mr. Plant's life-long study, will doubtless prove valuable. They are said to be complete for upwards of forty-six years. In 1862 he read a paper before the British Association at Cambridge on "Osler's Anemometer at the Birmingham and Midland Institute," and described the working of the instrument by means of lithographed drawings which he had himself prepared. Three years later he read another paper before the same Association at Birmingham on the "Anomalies of our Climate." A paper on the "Health of the Borough of Birmingham" was read in 1868 by Mr. Plant before the Social Science Congress at Birmingham. He frequently lectured on meteorology, and was a constant contributor to the local press on the same subject.

The Earl of Crawford and Balcarres has been elected an honorary member of the Berlin Academy of Sciences.

Dr. Hicks is reported to have made an interesting discovery in a cave at the back of the Ffynnon Beuno, Flintshire. The cave is a waterworn cave in the limestone rock, similar, though on a smaller scale, to the celebrated Cefn bone caves on the other side of the Vale. Dr. Hicks, after a general inspection of the interior, determined to examine beneath the floor of the cave at the entrance. The removal of a few inches of surface debris disclosed a virgin floor of stalagmite, so well known to cave explorers. Below this were found pieces of bone belonging most evidently to the mammoth or rhinoceros. One piece was embedded in the stalagmite floor. The largest piece—nearly six inches by four—must have formed part of a bone some eighteen inches in circumference. Below was another floor of stalagmite covering a quantity of drift gravel which rested on the bottom of the cave.

Mr. Floyd Delafield of Noroton, Conn., has brought out a new dynamo, the novel feature being that the armature is a tube of copper. One of the field magnets is terminated at either end by a tubular pole piece; within this pole piece rotates a tubular armature. On either side of the central magnet runs an auxiliary magnet, which is attached to the axle of the armature. Thus the tubular armature has one pole as its axle, whilst the other pole completely surrounds it. The current is drawn off at either end of the cylinder by brushes. The machine is so arranged that one armature can be used to excite the magnets, whilst the other is used for the main circuit, which gives a good current for plating purposes, or, when required for incandescent lighting, the magnets may be excited by a small high tension dynamo, and then the two armatures may be used for main circuit purposes.

Scientific authorities are not at rest with giving Philipp Reiss the merit of inventing the telephone. The latest claimant put forth is Charles Bourseul, a Frenchman, who is said to have invented the telephone in 1854. This invention is said to have been communicated in 1854 to the French Academy, and to have appeared in the *Didaskalia*, a supplementary paper to the *Frankfurter Journal*, for September 28th, 1854. M. le Comte du Moncel is advocating the claims of Bourseul.

M. Berthelot has been investigating the speed of gaseous explosions. For this purpose he used an iron tube 16 inches long and ⅓ inch bore. The gases were exploded by a spark, and the explosion registered at the centre and end of the tube. The gases he used were carbonic oxide and oxygen, their rate of explosion he observed to be 2500 metres per second. This is a far greater speed than was expected.

In the experiments which have been made at Grenoble for the transmission of electric force from a distance of 14 kilometres, the wire was of silicated bronze 2 mm. diameter, instead of iron as on former occasions. According to *L'Électricité* the results have been very poor, a motive power of 45 horses having been required to convey 7½ horse-power.

The observatory at Montmartre, Paris, which belongs to Dr. Gruby, has been reorganised, and M. Cassé has been appointed director. It is a private establishment devoted to meteorology, the results being published in a number of the Paris daily papers. It is built in the vicinity of the Moulin de la Golette, and is now, except the latter establishment, the most elevated point in Paris.

MM. Tissandier have completed the construction of their apparatus for preparing hydrogen by a continuous process for filling large balloons. It was tried with a balloon of 300 cubic metres, which conveyed the two brothers to some distance from Paris. This system is a simplification of the apparatus which was used by M. Giffard in his large captive balloon. It will be used for filling the electric balloon now being built by MM. Tissandier.

Dr. Liebscher of Jena University sends us some remarks in reply to Mr. B. Kotô's article on "Agriculture in Japan" in Nature, vol. xxviii. p. 231. With regard to Mr. Kotô's statement that in describing the climate of Japan Dr. Liebscher entirely disregarded the fact that the empire "is surrounded on all sides by a large body of water," he refers to his map of Japan and to p. 8 of his work, where he says: "The summer or south-west monsoon, which on its way from the tropics sweeps over the warm Pacific and is saturated with steam . . ." With regard to what Mr. Kotô says concerning Lake Hakone, Dr. Liebscher maintains that the Hakone Pass is situated not at the foot of the Fuji San, but at a distance of thirty-three miles from its foot, or about fifty miles from the summit, on quite a different range of mountains. Moreover, Dr. Liebscher points out that Fuji San is not an active volcano "which sends out an enormous quantity of scoriæ" like Vesuvius; nobody, Dr. Liebscher states, has ever seen any trace of scoria or smoke about it since the year 1707. As to Mr. Kotô's statement that "the climate of Japan is not so ineffective as Dr. Liebscher has depicted in his work; in reality it is far more conducive to fertility than that of Germany," Dr. Liebscher maintains that in his book the very contrary of what Mr. Kotô implies will be found, indicating especially the conclusion of what he says on the natural foundation of agriculture in Japan (p. 58). There it is stated that, "owing to the climate rather than to the rich soil, an amazingly large number of people can live in Japan on the produce of one field." Similar misunderstanding, Dr. Liebscher writes, has been shown by Mr. Kotô in his remarks on the geology and the soil of Japan, in his opinion concerning the Japanese land-tax system, in what he says on the religion of his countrymen, and in denying the existence of polygamy among them.

A SHARP shock of earthquake was felt at 8 o'clock on September 2 at Frascati, on the Alban Hills, twelve miles from Rome. The movement was undulatory and lasted several seconds, but without causing any damage. The instruments in the observatory of the Roman College noted at the same hour a sensible undulatory movement, in the direction of from north-east to south-west. The earthquake was felt simultaneously at Albano, Ariccia, Genzano, Rocca di Papa, Monte Porzio, and other towns on the Alban Hills. At Rocca di Papa a slight shock also occurred a few days ago. New York papers report an earthquake at Pachuca, in Mexico, by which twenty persons lost their lives. A shock was felt at Fjösanger in Bergens Stift, Norway, on August 17, at 10 p.m.

A CORRESPONDENT points out that an account of Prof. Edlund's theory of the connection between thunderstorms and auroræ will be found in *Petermann's Mittheilungen* for 1879, p. 76.

IT is stated that an important oyster bed has been discovered in the Medway. It is estimated to contain over a quarter of a million of young oysters. The Medway was formerly a famous oyster fishery, and it is hoped from this discovery that it is about to become so again.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus erythræus* ♀) from India, presented by Miss Garwood; a Golden Eagle (*Aquila chrysaetos*) from Scotland, presented by Mr. Bertram B. Hagen; two Long-eared Owls (*Asio otus*), British, presented by Mr. Percy F. Fordham; a Mocking Bird (*Mimus polyglottus*) from North America, presented by Mr. A. Townsend; two Marsh Harriers (*Circus æruginosus*), European, presented by Lieut.-Col. E. Delme Radcliffe; two Barbary Apes (*Macacus inuus*) from North Africa, deposited; a Silvery Gibbon (*Hylobates leuciscus* ♂) from Java, an Indian Muntjac (*Cervulus muntjac*) from India, four Passerine Doves (*Chamæpelia passerina*) from America, a Malabar Parrakeet (*Palæornis columboides*) from Southern India, a Boatbill (*Cancroma cochlearia*), an Anaconda (*Eunectes murinus*) from South America, a Sharp-nosed Crocodile (*Crocodilus cataphractus*) from Central America, purchased; two Ostriches (*Struthio camelus* ♂ ♀) from Africa, received on approval.

OUR ASTRONOMICAL COLUMN

TEMPEL'S COMET, 1873 II.—M. Schulhof of Paris has published elements and an ephemeris of this comet for the approaching return to perihelion. The following is the predicted orbit:—

Epoch, 1883 *October* 20^d·0 *M.T. at Berlin*

	°	′	″	
Mean anomaly...	354	5	43·5	
Longitude of perihelion	306	7	4·4	M.Eq. 1880·0.
,, ascending node...	121	2	8·5	
Inclination	12	45	17·1	
Angle of eccentricity	33	32	29·5	
Mean daily sidereal motion ...	681″·1068			
Log. semi-axis major	0·477861			

From these elements we find the time of perihelion passage November 20·17155 G.M.T., and the period of revolution 1902·77 days. M. Schulhof's ephemeris so far published extends from August 28 to November 8; during which period the comet is slowly receding from the earth. We extract a few positions:—

At Berlin Midnight

		R.A.			N.P.D.		Log. distance from	
		h.	m.	s.	°	′	Earth.	Sun.
Sept.	21 ...	15	19	50 ...	101	51·0 ...	0·2732 ...	0·1739
	23 ...	15	25	3 ...	102	24·8		
	25 ...	15	30	22 ...	102	58·3 ...	0·2739 ...	0·1687
	27 ...	15	35	47 ...	103	31·8		
	29 ...	15	41	17 ...	104	4·6 ...	0·2744 ...	0·1637
Oct.	1 ...	15	46	53 ...	104	37·2		
	3 ...	15	52	35 ...	105	9·4 ...	0·2750 ...	0·1589
	5 ...	15	58	22 ...	105	41·2		

Unless the comet is observed at the present return, observations will hardly be possible before the spring of 1894.

THE GREAT COMET OF 1882.—Dr. B. A. Gould, director of the Observatory at Cordova, informs us that this comet was last seen there with the naked eye on March 7, when Mr. Thome found it already very faint in the telescope, and no nuclear condensation perceptible. His last observation was on June 1, but it was not possible to use the filar micrometer, and he had to depend upon the circles of the equatorial. Had it not been less than an hour high at nightfall, he thinks he could have observed it for a month longer. The Cordova refractor is of ten inches aperture. On March 7 the distance of the comet from the earth was 3·07.

THE MINOR PLANET, NO. 234.—Prof. Krueger communicates in a circular two observations of the small planet last discovered, telegraphed by Mr. O. C. Wendell, from which it appears that the daily motion in N.P.D. is as much as 21′, or, reducing the places for August 12 and 24 to longitude and latitude, we find a change of latitude of 3° 13′ in the interval, the descending node being passed on August 23. This seems to point to a considerable inclination of the orbit. The Harvard positions are as follow:—

G.M.T.	R.A. °	′	″	N.P.D. °	′	″
1883, August 21·7470 ...	318	57	43 ...	105	24	9
24·7274 ...	318	36	0 ...	106	20	34

Of the large number of these bodies now known, *Pallas*, the second in order of discovery, still retains the greatest orbital inclination, 34° 44′ at present.

GEOGRAPHICAL NOTES

IN the interests of anthropology, Dr. A. B. Meyer, curator of the Dresden Ethnological Museum, has just issued some practical suggestions addressed to the officers of the German Imperial Navy visiting the Indo-Pacific waters. The chief object of this "Denkschrift" is the completion of the Dresden ethnographic collection, whose desiderata are mentioned in detail, and special instructions are given as regards the Chinese seaboard, the South Sea Islands, the north-west coast of America, Madagascar, the Eastern Archipelago, and in general such places as lie on the ordinary route of the German Navy. Here is still to be gathered a rich harvest of materials illustrating the usages, traditions, religions, and social culture, especially of the Polynesian, Papuan, Indo-Chinese, Malay, and North American races. Many objects may thus be brought together calculated to throw light on such important historic and religious movements as the spread of Buddhism from India throughout East Asia, and the influence of Hinduism in past times on the local cultures in Further India and Malaysia. Amongst the miscellaneous wants particular mention is made of fishing gear, boat models, and musical instruments from Formosa; blowpipes, krisses, shields, and brass armour from the Sulu Archipelago and Palawan; nets, harpoons, magic wands from Corea and Yesso; wood carvings and idols from New Guinea and New Britain; clubs, spears, stone hatchets, tattoo designs, figures of men and animals in wood or stone from Melanesia; objects of fetish worship from Micronesia; jade ornaments from Polynesia; carved wooden masks of men and animals, clay or stone vessels, tobacco pipes and nephrite objects from the north-west coast of America; talismans, idols, house utensils, and weapons from Madagascar; wicker-work, burnt clay figures of evil spirits, woven materials